[0093] By way of another example, FIG. **10**B depicts an alternative example of the key assembly of FIG. **10**A where the first flanges **1034** include a first protrusion **1036** that interacts with a second protrusion **1037** of the second flanges **1035**. In this implementation, the first and second protrusions **1036**, **1037** may travel with respect to each other to block contaminant ingress during part or all of motion of the key cap **1003**. Thus, even though the first and second flanges **1034**, **1035** cease blocking contaminant ingress during key cap **1003** motion, the first and second protrusions **1036**, **1037** may continue to block.

[0094] In some implementations, the first and second protrusions **1036**, **1037** may be configured with sufficient dimensions to block contaminant entry during all motion of the key cap **1003**. However, in other implementations, the first and second protrusions **1036**, **1037** may have dimensions that form a gap between the first and second protrusions **1036**, **1037** when the key cap **1003** travels a sufficient distance toward the substrate **1016**.

[0095] Although particular contaminant ingress prevention and/or alleviation mechanisms have been illustrated and discussed above with respect to FIGS. **1**-**10**B, it is understood that these are examples. One or more of the contaminant ingress prevention and/or alleviation mechanisms illustrated and discussed above with respect to FIGS. **1**-**10**B may be combined without departing from the scope of the present disclosure. Further, other contaminant ingress prevention and/or alleviation mechanisms may be used and/or combined with one or more of the contaminant ingress prevention and/or alleviation mechanisms illustrated and discussed above with respect to FIGS. **1**-**10**B without departing from the scope of the present disclosure.

[0096] For example, in some implementations, key assembly movement mechanisms may include one or more crushing components, such as knobs, spikes, and the like. If contaminants such as chip crumbs reach internal areas of key assemblies, the contaminants may be broken down by the crushing components during motion of the key assemblies. This may prevent the contaminants from blocking key motion. Cavities, holes, or other features may also be combined with such implementations so that the crushed contaminants may be able to exit the internal areas. In implementations using bellows elements, forced gas may blast the crushed components from the internal areas.

[0097] By way of another example, in some implementations, the electronic device that includes the keyboard **102** may include one or more fans, such as one or more cooling fans. Air from these fans may be directed to blast contaminants away from key assemblies and/or to prevent contaminant ingress into key assemblies. In other implementations, similar functions may be performed by various transducers, actuators, vibrators, or other such components. For example, speaker membranes and/or haptic actuators (such as a haptic trackpad) may be vibrated to dislodge contaminants from key assemblies. By way of other examples, acoustic devices may resonate at frequencies that break up lodged contaminants and/or drive contaminants away from key assemblies.

[0098] In other examples, hollow passageways may connect key assemblies to an external port. Compressed air or other gas may be forced into the port to blast contaminants out of the key assemblies.

[0099] By way of other examples, contaminants like dust may be electrically charged. Substrates and/or other components may be operative to oppositely charge, driving the contaminants from key assemblies. For example, a keyboard **102** may emit an electrostatic discharge to drive out dust or other contaminants.

[0100] In still other examples, various combinations of hydrophobic and/or hydrophilic coatings may be disposed on surfaces around apertures between key assemblies and keyboard webs. These coatings may prevent ingress of liquid, guide liquid ingress towards exits, and so on.

[0101] In yet other examples, the liquid seals provided by membranes or other guard structures may allow solvents or other liquid cleaners to be applied to a keyboard. The liquid seals may prevent the solvents or other liquid cleaners from damaging sensitive keyboard components while the solvents or other liquid cleaners break up and/or remove dust, dirt, sugars or other residues, and/or other contaminants that have lodged in various areas of the keyboard.

[0102] In still other examples, heating elements may be included. These heating elements may liquefy residues, such as sugars, that have lodged in a keyboard. Once liquefied, the residues may be able to exit the keys or the keyboards. In other examples, the heating elements may evaporate or burn off residues and/or other contaminants rather than liquefying the residues and/or other contaminants.

[0103] By way of other examples, gaskets may extend between key caps of the keys. These gaskets may be formed of rubber, elastomer, and/or other flexible materials and may block entry of contaminants into key stack assemblies.

[0104] Although the contaminant ingress prevention and/or alleviation mechanisms are illustrated and discussed above with respect to keys or key assemblies and keyboards, it is understood that these are examples. In various implementations, one or more of the mechanisms discussed herein may be utilized with other devices without departing from the scope of the present disclosure.

[0105] Further, the movement mechanisms **215**, **415**, **515**, **615**, **715**, **815**, **915** are illustrated as a representative structure (movement mechanisms **215**, **415**, **515**, **615**, **715**, **815** illustrated as butterfly mechanisms and movement mechanism **915** illustrated as a scissor mechanism). It is understood that any movement mechanism or structure may be used. Living hinge structures, butterfly mechanisms, scissor mechanisms, spring mechanisms, and the like are all examples of suitable movement mechanisms that may be incorporated into various embodiments.

[0106] Additionally, the electronic device **100** of FIG. **1** is illustrated as a laptop computing device with an incorporated keyboard **102**. However it is understood that this is an example. In various implementations, the electronic device **100** may be a variety of different electronic devices with internal and/or external keyboards and/or other input devices. For example, in some implementations the electronic device **100** may be an external keyboard. By way of other examples, the electronic device **100** may be a phone, a desktop computing device, a digital media player, a display, a printer, and so on.

[0107] As described above and illustrated in the accompanying figures, the present disclosure relates to keyboards and/or other input devices that include mechanisms that prevent and/or alleviate contaminant ingress. These mechanisms may include keyboard membranes or gaskets; structures such as brushes, wipers, or flaps in gaps between key caps of the keys; funnels, skirts, elastomer or other bands, or other guard structures coupled to key caps; bellows that blast contaminants with forced gas; and/or various active or